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No. 110

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15 July 1981

CHINA REPORT

SCIENCE AND TECHNOLOGY

No. 110

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APPLIED SCIENCES

USE OF NEW TECHNIQUES IN CONDUCTING SURVEYS DESCRIBED

Geological Survey Methods

Beijing GUANGMING RIBAO in Chinese 14 Apr 81 p 2

[Article by Zhou Xiang [0719 5046]: "Jilin Province Accelerates Geological Survey with New Techniques"]

[Text] In the past few years, the Jilin Provincial Geological Bureau has tested and developed a number of new techniques, including remote sensing, computer application, new physical and chemical exploration methods, small-bore diamond drilling and aerial survey, and has obtained good results and quickened the pace of mineral survey and exploration.

The remote-sensing technique has been used in search of water-rich fracture zones and has led to pronounced results. In the Dahuanggou area in Yushu County, aerial and satellite photography were used together with ground geological survey and electrical exploration to uncover a hidden fracture zone in a low water area. This zone is 60 kilometers long and 2 kilometers wide. After drilling confirmation, six artesian wells were drilled and each produced water. The water production rate is 30 tons per hour per well. It is thus proved in practice that the remote-sensing technique is very effective in detecting hidden fracture zones in plane surface areas.

Using aerial photographic data in a 1/200,000 ratio regional geological survey not only reduces the volume of actual survey work but also insures the map quality. Aerial photographs were used in the interpretation of Jiaohe area data and allowed the survey line spacing to be reduced from 2 kilometers to 3-5 kilometers. In addition to saving 1,382 kilometers of line survey work and reducing the number of observation points by more than 600, two mineralized alkaline rock formation sites containing copper and nickel were uncovered and the mission was completed 1 month ahead of schedule.

In the electrical method, a high-power short-lead large area survey was compared to single-station long-lead electrical excitation and the former was found to be 8-10 times more effective. From 1973 to the present, just one electrical survey subunit of the exploration team has surveyed an area of 900 square kilometers on various scales, discovered 123 anomalies, pinpointed 10 prospect zones and discovered and confirmed a dozen mineral sites, two of which turned out to be medium-size ore deposits.

Before 1975, the same subunit could only complete 10-20 square kilometers on a scale of 1/5,000 in 1 year. Today, all the field geological teams and geological survey stations are equipped with high-power electrical mobile units and are carrying out electrical scanning.

The development of small-bore diamond drilling technology has not only improved the engineering quality and reduced the labor intensity and cost, but has also greatly accelerated the speed of survey and exploration, reduced the lead time for exploration and achieved good results. Take the Lianhuashan copper mine in Tuquan County, for example. The detailed master plan called for 80,000 meters of drilling exploration and anticipated a yield of 120,000 tons of copper metal. Based on the speed of the seven large-bore brass-bit drilling rigs operating at the time, advancing at the rate of 1,300 meters per year, it would have taken 8-10 years to complete the detailed exploration. Since 1977, the new small-bore diamond drilling technology has been widely used in this mining area; the monthly efficiency has increased 3.5 times, the yearly advance has increased 2.4 times, and the time required to complete the detailed exploration of the entire mining zone has been reduced by 3 years. In addition, small-bore diamond drills are also widely used at the Budunhua copper mine, the Lihechuan nickel mine, the Toudaogou magnetic pyrite mine and the Chibansong nickel mine, reducing the lead time for scientific investigation.

Satellite Remote Sensing of Resources

Fuzhou FUJIAN RIBAO in Chinese 28 Mar 81. p 1

[Article by Zheng Kexing [6774 0344 5281]: "Fujian To Use Satellite Remote Sensing in Earth Resources Survey"]

[Text] Departments in the government has decided to test satellite remote sensing of earth resources in Fujian.

As a first step of the testing work, a 10-member team led by Li Boheng [2621 0130 5899], director of the earth resources laboratory of the National Institute of Geodesy and Cartography, was assigned to come to Fujian with satellite remote-sensing photographs early this month to begin the investigation. They began their studies in eastern, southern and northern Fujian and performed onsite confirmation and photographic study. Their testing work is now completed and they are drawing up proposals for provincewide testing scheduled for next year.

As compared to the aerial photography method, the satellite remote-sensing technique as applied to large area earth resources survey has advantages of high accuracy, high speed and low cost, and it has been widely employed in many economically developed nations. The full-scale testing work to be conducted in Fujian will not only greatly accelerate the survey of earth resources in Fujian, enable planning for the use, protection, development and management of earth resources, and provide a scientific basis for construction in agriculture, forestry, livestock industry and fishery industry, but it will also promote the modernization of survey and cartography technology in Fujian. The provincial agriculture department and survey bureau have given this work great attention; they listened to the testing reports given by Comrade Li Boheng and sent technical personnel with the team to learn and to assist with the work.

9698

CSO: 4008/374

BRIEFS

NEW CHARACTER ENCODING METHOD--Beijing, 11 Jun (XINHUA)--A computer system to numerically encode Chinese characters according to strokes, invented by Li Jinkai, a teacher in the Beijing Teachers University, has been registered in Britain for an international patent, according to the Chinese Language Information Processing Society of China. Li Jinkai has been working [on] the encoding system for nearly 20 years, finally succeeding in 1978. The system divides the pen strokes used to write the characters into eight categories, each of them numbered. Computers are able to receive and retain the information without any special equipment. An operator may enter up to 4,600 characters per hour. The system may also be used to compile Chinese dictionaries. Professor Qian Weichang, president of the society, said that of the 150 systems now extant for encoding Chinese characters, this has a prototype. [Text] [Beijing XINHUA in English 0716 GMT 11 Jun 81]

WATER DETECTION BY SATELLITE--Using photographs provided by satellites, an army capital construction engineering unit in charge of hydrogeological survey, in coordination with field geological personnel, has obtained encouraging results in search of water sources on the Qinhai-Xizang Plateau in a 20,000-square kilometer unpopulated glacier and desert area. Remote-sensing technique uses macroscopic photographs taken by earth satellites and accurately interprets the real appearance of different objects on earth. In a vast stretch of the Gobi Desert west of Tsaidam Basin, this unit of capital construction engineering workers completed a hydrogeological survey of 6,000 square kilometers using the remote-sensing technique. They also accurately calculated a 1,700-square-kilometer snow cover at the midsection of the 5,500-meter Qilian Shan, a major source of underground water in that area. [Text] [Beijing RENMIN RIBAO in Chinese 11 May 81 p 1] 9698

CSO: 4008/374

LIFE SCIENCES

REPORT ON NEW DIAGNOSTIC METHOD FOR ACUTE MYOCARDIAL INFARCTION

Nanjing XINHUA RIBAO in Chinese 5 Jun 81 p 2

[Article by Fang Zhengyuan [2455 2973 3293]]

[Text] Acute myocardial infarction is a serious disease, capable of causing sudden death. The currently commonly used EKG examination [for this disease] has a number of shortcomings. Through several years of diligent study, the Office of Clinical Experiment of Nanjing College of Medicine Hospital has found a new method of early stage precise diagnosis of myocardial infarction.

Through examining the CK-MD enzyme in the blood, they [the scientists of that office] can give sensitive, quick, and reliable early stage, precise diagnosis, and based upon the degree of change of this enzyme, they can use a mathematical equation to compute the size of the area of myocardial necrosis. Since this technique came to be used last year, the life of many acute myocardial infarction patients has been rescued.

Enzyme is a special protein extensively distributed in cells. It is a catalyst for various chemical reactions within the body and is an important substance for maintaining live activity. When a disease occurs, the cell membrane is damaged and the enzyme leaks out of the cell membrane to enter the blood stream and causes the enzyme content of the blood to increase. The CK-Mb enzyme exists only in myocardial cells. Only in the blood of acute myocardial infarction patients, will this enzyme increase; therefore, when a chemical method is used to identify it, the disease may be more quickly diagnosed.

The Nanjing College of Medicine Hospital experimental Office established the technique of serum phosphocreatikinas test to diagnose acute myocardial infarction in 1973. Due to the fact that this enzyme is not highly specific and can easily be confused with other muscle diseases, clinical application of the technique proved it to be unsatisfactory. Last year, the scientists in the office and a research student overcame many difficulties of equipment and test materials and carried the research further. Finally, they found in isoenzyme of phosphocreatikinas MB, to establish the new technique. The difficulty of early state precise diagnosis of myocardial infarction is thus resolved.

The researchers of the experimental office of that hospital have had a history of studying enzymatic diagnosis for more than 20 years. As early as 1958, they

succeeded, simultaneously with [scientists] in Shanghai, Beijing, etc. in contributing to the technique of using the serum transaminase test to diagnose viral hepatitis. In these 20 plus years, they performed a great deal of work in looking for this sensitive and specific enzyme and succeeded in finding 12 enzymes, which brought them praise from clinical [physicians.] Now, they rank first place in the country in enzyme work.

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CSO: 4008/397

LIFE SCIENCES

PROGRESS IN BATTLE AGAINST SCHISTOSOMIASIS REPORTED

Beijing GUANGMING RIBAO in Chinese 12 Jun 81 p 1

[Article by Xie Jun [6200 6511]

[Text] Most recently, this reporter learned from the Central Schistosomiasis Prevention Leadership Team Office that: After more than 20 year of diligent work, great achievements have been obtained in China in the prevention and control of schistosomiasis. According to statistics, to date, snail extermination has been accomplished over areas totaling more than 100 billion m². More than 9 million schistosomiasis victims have been cured. The disease has been basically eliminated in more than 240 counties and cities. These figures amount to more than two-thirds of endemic counties, cities, and victims of this disease. In the five provinces, cities, and autonomous regions of Guangdong, Guangxi, Fujian, Shanghai, and Jiangsu, this disease has been basically eliminated.

The work of schistosomiasis prevention and control in China is closely related to the development of scientific research. After the central party established the Schistosomiasis Prevention and Control Leadership Team, for the purpose of strengthening the forces of scientific research, the National Schistosomiasis Research Committee was established to unify the work and to strengthen the Research Institute of Parasitism. Research committees and research institutes were also established in related provinces, cities, and autonomous regions. Some medical schools also arranged to have their researchers participate in schistosomiasis prevention work. The masses of scientific researchers had an important function in the project. Under the support of the masses, they went to the endemic areas to carry out surveys and studies. Within a short period of time, the condition of snail distribution in the country was understood as well as the range of prevalence of schistosomiasis. They provided a large quantity of scientific data and many technical schemes for the development of snail extermination and victim treatment programs. They also cooperated with related pharmaceutical plans to create, through successful research, many types of snail exterminating drugs, and drugs effective for the treatment of and protection from [schistosomiasis]. These drugs are unique creations of China.

6248

CSO: 4008/397

BURN SURFACE REACTION TO THREE KINDS OF GRAFTING MATERIALS

Beijing JIEFANGJUN YIXUE ZAZHI [LIBERATION ARMY MEDICAL JOURNAL] in Chinese No 2, 1981 pp 92-93

[Article by Nan Changqing /0589 7022 3237/ Liu Tianxi /0491 1131 0023/ Kang Shaoyu /1660 4801 4416/ Zhang Yaping /1728 7161 5493/ Wang Tianyi /3769 1131 0001/ Wang Songbao /3769 2646 1405/ You Zhongyi /1429 1813 5030/, of Research Office of Burns, Third Office of Burns, Third Military University of Medicine]

[Text] At present, for the treatment of deep and large area burn wounds, early excision of scars and skin transplant to cover the wound surface remain one of the important measures. This type of patient generally has a limited area of skin for autograft. For many years, allografts have been used for temporary cover and proved to be successful. There is, however, some difficulty in obtaining allografts, especially if there are a large number of burn patients. The supply of allografts is limited and it is difficult to satisfy all the needs; also they involve antigenic conditions. Research on an artificial skin with an extensive source of supply and no antigenic characteristic is, therefore, a subject in urgent need of resolution. The object of this experiment is to observe the effects of the 41-type of artificial skin on the histological reaction induced by the wound surface and the growth of the patient's skin. It is also compared with the No II artificial skin and allografts.

Experimental results with the three types of grafting materials are as follows:

Method of Experiment

The histological reaction of burned surface to 3 types of artificial skin was observed in 14 healthy male dogs. Both sides of the experimental dogs were burned with 3 percent solidified gasoline to achieve third degree burns. Under general anesthesia and aseptic work condition, scar excision was performed to leave a wound surface of 3×10 cm, which was covered by prepared grafting materials measuring 1 cm² each. The dogs are divided into 3 groups: the 41-type artificial skin group, the No II artificial skin group, and the allograft group, the latter 2 groups are the control groups. For each group, there were 25 pieces of grafts, which were removed after 2, 4, 6, 8, 10 days following the surgery, 5 pieces on each of these dates. Normal skin tissues surrounding the edges of the wound were removed with the grafts, and they were fixed for 24 hours in 10 percent formaldehyde solution before HE staining to make paraffin slides for histological observation.

Results

I. Histological Reaction After 2 Days

The 41-type artificial skin group: There is some neutral white cell infiltration between the nylon velvet and the wound surface. Some nuclei are firm and contracted or even broken. The capillaries of the wound surface are distended and congested with blood. Obviously necrotic tissues are not observed.

The No II artificial skin group: On the surface of the wound, there is a layer of compacted, yellow colored materials with no structure. A part of this layer is separated from and a part of it adheres to the wound surface. Below these yellow colored materials, there are small amounts of necrotic tissues and a large quantity of cellulose seepage and neutral white cell infiltration. The capillaries of the wound surface are distended and congested with blood and degeneration phenomenon appears in the corium cell of individual capillaries. There is obvious edema in the fibrous connective tissues. In the deep layer, there is also scattered white cell infiltration.

The allograft group: Under the allograft, there is a small quantity of fluid seepage and scattered white cell infiltration. The capillaries are slightly distended and congested. Inside the allograft, inflammatory reaction and tissue necrosis are not observed, except in one case where there is some necrosis, perhaps due to severe injury when the skin is removed.

II. Histological Reaction After 4 Days

The 41-type artificial skin group: Between the wound surface and the adhered nylon velvet, there remains a small amount of neutral white cell infiltration, and distended and congested capillaries. In a portion of the area, there is obvious hyperplasia of fibrous mother cells and capillaries to form granulation.

The No II artificial skin group: Below the substance that adheres to the wound surface and in the deep-layer tissues, there remain a large quantity of neutral white cells and cellulose seepage, as well as obvious edema of the connective tissues, but no obvious hyperplasia of granulated tissues.

The allograft group: At the point where the allograft and the wound surface fuse, growth of granulated tissues is relatively active and there is neutral white cell infiltration, especially in the allograft. Compared with the condition on the second day, inflammatory reaction is relatively more obvious.

III. Histological Reaction After 6 Days

The 41-type artificial skin group: The inflammatory reaction of the wound surface is obviously lessened; the growth of granulated tissues is extremely active; and a large quantity of granulated tissues are growing toward the wound surface. Between the wound surface and the nylon velvet, there is a large quantity of hyperplasia of capillaries (See Fig 1) accompanied by a small amount of foreign substance cell reaction. In the slide, epidermic cells coming from the edges of the patient's own skin may be observed spreading toward the center of the wound surface, in a creeping manner.

The No 11 artificial skin group: Below the substance that adheres to the wound surface, there remain a large quantity of cellulose and neutral white cell seepage (See Fig 2) as well as hyperplasia of capillaries and fiber cells in some areas.

The allograft group: At the point where the allograft and the wound surface fuse, there is an obvious region of granulated tissues. The blood flow is good and the allograft remains alive. Obvious inflammatory reaction and tissue necrosis are not observed.

IV. Histological Reaction After 8 Days

The 41-type artificial skin group: On the wound surface, there is a large quantity of fibrous granulated tissues. A part of the nylon velvet is in the newly grown granulated tissues. There is foreign substance giant cell reaction on the side of some nylon fibers. There is growth of capillaries and fibrous mother cells between the wound surface and the nylon fiber, but substance cell reaction is observed surrounding the residual fragments. The peripheral fibrous granulated tissues grow toward the center of the inflamed area (See Fig 4). The wound is about to heal. The morphological structure of the residual gelatinous tissues is slightly different from that which is observed on the 2d day. The acid staining changes from the yellow color to light yellow. They may be absorbed.

The allograft group: In the vicinity of the small vessels of the dermis of the allograft and surrounding individual hair follicles, lymphocyte infiltration may be observed. The degree of infiltration is more obvious than the condition on the 8th day (See Fig 5) but the allograft does not degenerate or shed and the rejection reaction is also mild.

Discussion

In the past 2 decades, there have been extensive studies in foreign countries (4) on artificial skin materials and several relatively good artificial skins have been produced, but to date, there remains no ideal artificial skin. Research on artificial skin began in 1970 in China, and since then, the No 11 artificial skin, the 204 artificial skin, and the 41-type artificial skin have been created. After considerable clinical testing, they have demonstrated relatively satisfactory results.

Through the above animal experiment, and a comparison of histological reactions of the burned and excised surface induced by the 3 covering materials, it appears that with the allograft, the inflammatory reaction is not obvious, but due to antigenic characteristic, rejection reaction occurs after it is used to cover the wound for a week. With the No 11 artificial skin, the inflammatory reaction is relatively severe and lasts a long time; the wound surface repair is relatively slow; and there is foreign substance reaction. With the 41-type the growth of granulation is not as active as on the 6th day. Basically, there is no longer any inflammatory reaction. Some epidermic cells along the edge of the wound are creeping below the nylon velvet. Some nylon fibers are obstructing the extension of the epidermic cells.

The No 11 artificial skin group: The growth of granulated tissues is active, toward the gaps of the covering materials. There is foreign substance cell reaction and giant foreign substance cells are occasionally observed. In these giant cells, there

are more than 20 nuclei and foreign substance is found in the cytoplasm. Inflammatory reaction is obviously lessened. In individual slides, the epidermic cells on the edge of the patient's own skin may be observed to creep under the covering material toward the center of the wound surface. The phenomenon of obstruction is not observed. The growth of the epidermic cells is also very active.

The allograft group: In the vicinity of the small blood vessels of the dermis of the allograft and surrounding individual hair follicles, lymphocyte infiltration may be observed. There is perhaps a rejection reaction, but the allograft is not observed to degenerate and shed.

V. Histological Reaction After 10 Days

The 41-type artificial skin group: The wound surface is completely replaced by newly grown fibrous granulated tissues and gelatinous tissues. The shed nylon fibers are enveloped by the newly grown granulated tissues, adhering very closely (See Fig 3). The morphological structure is not very different from the observation on the 2d day; the nylon fibers are not absorbed.

The No 11 artificial skin group: In the center of the wound surface, there is still infiltration, and foreign artificial skin, the inflammatory reaction is relatively mild; the wound surface repair is relatively fast; a large quantity of granulated tissues grow into the nylon fibers, and the shed nylon fibers are even buried in the granulated tissues to make it difficult to separate them from the tissues. This result corresponds with the Hall (6) report. The 41-type artificial skin adheres to the wound surface well and there is growth of fibrous mother cells in it. This result is identical with the experimental result of Schwabe (7) et al. The histological reaction to the nylon velvet is similar to the inflammatory and foreign substance reaction with a large quantity of giant cells and white cells surrounding the high molecular materials made in foreign countries for medical use. The histological reaction to the No 11 artificial skin is basically the same as the result of a pathological examination carried out by the Nanjing Troup General Hospital (8). With regard to the problem of the effect of the artificial skin on the extension of the patient's own skin, it is generally believed to be a displacement effect. The better the adhesion, the more obvious is this effect and the same effect is also produced by allograft. Judging from the data of the above 3 types of grafting materials, the effect of the 41-type artificial skin on the extension of the patient's skin is more obvious than the No 11 artificial skin and the allograft. Dressler (10) proposed that if nylon fibers are made into an inner layer of short and fine loops, it perhaps will not affect the extension of the patient's own skin. The authors tried to make this kind of artificial skin. Judging from animal experimentation and clinical testing results, its effect on the extension is even more obvious.

Although the 41-type artificial skin has been improved regarding to the manufacturing process, there are still shortcomings, but in view of the shortage of autografts and allografts, it may still have the function of temporary protection of the wound surface to reduce the loss of moisture. It is, therefore, a relatively good grafting material.

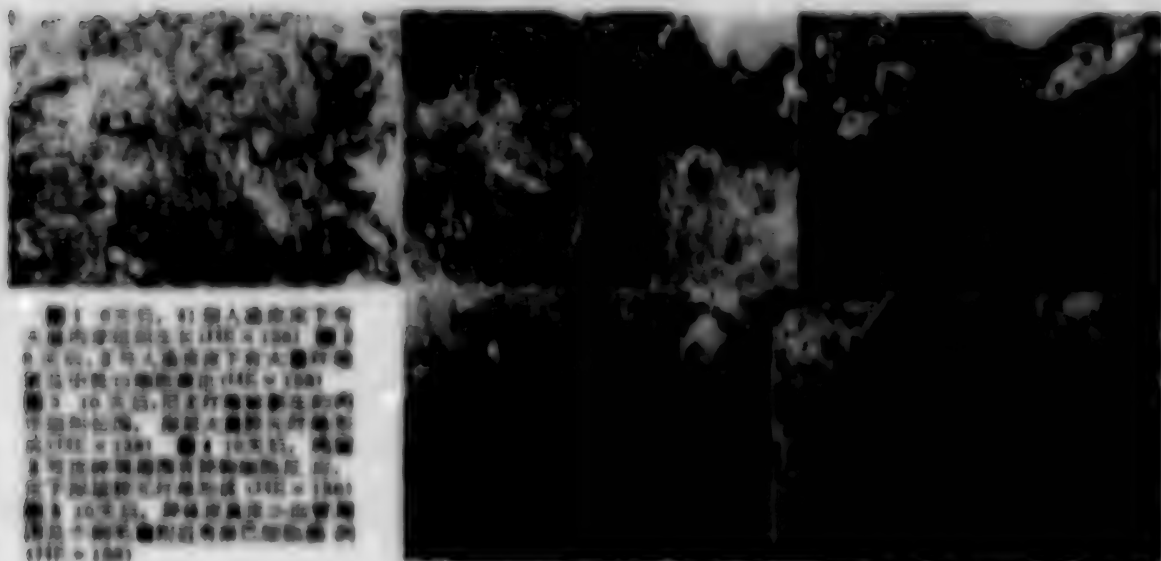


圖1: 6天後, 41型人造皮膚下有
 大量肉芽組織生長 (HE x 130) 圖2:
 6天後, Ⅱ型人造皮膚下有大量肉芽
 組織及中性白血細胞滲出 (HE x 130)
 圖3: 10天後, 尼龍纖維被新長出的肉
 芽組織包圍, 深層真皮層形成
 大量膠質纖維 (HE x 130) 圖4: 10天後, 殘留
 Ⅱ型人造皮膚碎片在真皮深層, 周圍
 有異質反應及膠質纖維形成 (HE x 130)
 圖5: 10天後, 移植物真皮小血管周
 圍及毛囊周圍有淋巴細胞滲出
 (HE x 130)

Experimental Observation of Histological Reaction of Burn Wound Surface to 3 Types of Skin Grafts

Fig 1: After 6 days, there is growth of a large quantity of granulated tissues below the 41-type artificial skin (HE x 130).

Fig 2: After 6 days, there is a large quantity of cellulose and neutral white cell seepage below the No II artificial skin (HE x 130).

Fig 3: After 10 days, the nylon fibers are enveloped by the newly grown granulated tissues and a large quantity of gelatigenous fibers of the deep layer are formed (HE x 130).

Fig 4: After 10 days, there is foreign substance cell reaction surrounding residual No II skin fragments, in the hypodermic deep layer, gelatigenous fibers are formed (HE x 130).

Fig 5: After 10 days, there is lymphocyte infiltration surrounding small blood vessels of the allograft dermis and in the vicinity of individual hair follicles (HE x 130).

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 C80: 4008/376

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Wuhan WUHAN SHUILI DIANJI XUEYUAN XUEBAO [JOURNAL OF THE WUHAN INSTITUTE OF HYDRAULIC AND ELECTRICAL ENGINEERING] in Chinese No 1, 1981 inside back cover

- [Text] An Experimental Investigation for the Attraction Forces of the Marine Mud on the Bottoms of Off-shore Structures.....Feng Guodong [7458 0948 2767], Liu Zude [0491 4371 1795], Yu Jimin [0205 1323 3046] and Liu Yiliang [0491 0001 0081], all of the Soil Mechanics Teaching and Research Group (1)
- The Program of the Nonlinear Finite Element of the Planar Composite Units.....Tan Dachang [6223 6670 1347], Building Mechanics Teaching and Research Group (11)
- The Velocity Distribution in the Turbulent Boundary Layer of Overflow.....Liang Zaichao [2733 0961 3390], Li Wei [2621 3555], Hu Zhenyu [5170 7201 1342] and Di Jiafu [3695 0502 4395], all of the Institute of Water Conservancy and Hydro-power (23)
- The Mechanical Effect of the Thickness of the Weak Intercalary Strata.....Sun Wanhe [1327 8001 0735], Zheng Tiansin [6774 6993 3046] and Li Mingying [2621 2494 5391], all of the Engineering Geology Teaching and Research Group (33)
- The Finite Element Numerical Model of Temperature Flow.....Zheng Bangmin [6774 6721 3046], Hydraulics Teaching and Research Group (41)
- The Vibration-proof Calculation of Highrise Frame Shear Wall Systems.....Duan Kegang [3008 0344 6245], Building Mechanics Teaching and Research Group; Li Chuancal [2621 0278 2080], Building Structure Teaching and Research Group; Zeng Xiangjin [2582 4382 6855], Mathematics Teaching and Research Group (51)
- The Determination of Cooling Capability for Hardening MediaGuan E [4619 6759], Machinery Teaching and Research Group (61)

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- Wien Bridge Oscillator with High Frequency Stability.....Chen Yiyao [7115 0001 1031], Electronic Technology Teaching and Research Group (95)
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- Reasonably Selecting Protective Devices under Conditions of Unequal Operation on 220 KV Transformer Circuit BreakerLi Xiaozhong [2621 2556 6945], Jiangxi Bureau of Electric Power Industry (109)
- Hydraulic Calculation of Closure by Computer.....Zhu Shaokang [2612 4801 1660], Jiangsu Department of Water Conservancy; Zhang Hongchu [1728 3163 2806], East China Water Conservancy College (113)

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CSD: 4008/335

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CSO: 4008/359

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ZHANG Guofu [1728 0948 1381]
SUN Chengqi [1327 2110 0796]
FENG Xueyi [7458 1331 5030]
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ORG: All of Beijing Institute of Control Engineering

TITLE: "Attitude Control System of Recoverable Earth-orienting Technology Testing Satellites and Some Flight Testing Results"

SOURCE: Beijing YUNANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS]
in Chinese No 2, 1981 pp 1-13

TEXT OF ENGLISH ABSTRACT: In the 1970's, three recoverable technology testing satellites, permitting orientation of observatory with respect to the earth, were successfully launched, operated in orbit and recovered. This paper reviews the three-axis stabilized attitude control system used in these satellites, including its composition, function and considerations in selecting the main parameters of the system, etc. Finally, the operating performances of the flight testing results are briefly described.

AUTHOR: OUYANG Shuiwu [2962 7122 3055 0710]
ZENG Guoming [6774 0948 6900]
YANG Xini [2799 1585 7206]

ORG: None

TITLE: "A Theory for the Ablation of Silica-reinforced Phenolic Resin Plastics and the Experimental Data"

SOURCE: Beijing YUNANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS]
in Chinese No 2, 1981 pp 14-22

TEXT OF ENGLISH ABSTRACT: The ablation of silica-reinforced phenolic resin plastics, subjected to aerodynamic heating and shear forces, is treated theoretically. In this paper the nature of the physical and chemical processes that occur during the ablation of these materials has been examined. The ablation process consists of melting, vaporization and decomposition of plastics and the chemical reactions on the surface material of a nose cone that re-enters the atmosphere at hypersonic speeds. The silica will form a flowing liquid layer. The gaseous products of the resin pass through the porous char layer and the liquid layer into the boundary layer. The effect of this mass addition to the boundary layer is to reduce the aerodynamic heating and shear forces.

The ablation theory was verified by an experiment in the arc air jet under the

[Continuation of YUJIANXUEBAO No 2, 1981 pp 14-22]

condition of stagnation point in laminar flow. It is found that the theoretical and experimental values for ablation velocities and surface temperature at stagnation point agree with each other within 15 percent.

AUTHOR: WANG Kechang [3769 0344 2490]

ORG: None

TITLE: "Computer Simulation of Liquid Rocket Engine Transients"

SOURCE: Beijing YUJIANXUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 2, 1981 pp 31-41

TEXT OF ENGLISH ABSTRACT: In this paper the transients are simulated by means of the characteristic method and the numerical computation method for start and shut-down processes, pulse operation, four-engine parallel operation and failure state of liquid rocket engine. Simulation is made on the "441B-III" computer. The simulated results show that in the engine development computer simulation would be necessary.

AUTHOR: MA Huiyuan [7456 1920 0337]

ORG: None

TITLE: "The Theoretical Analysis of the Command Remote Control System with Information Feedback Checking"

SOURCE: Beijing YUZHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS]
in Chinese No 2, 1981 pp 42-53

TEXT OF ENGLISH ABSTRACT: In the command remote control system with information feedback checking, the execute code adopts a tone code using a special sub-channel to complete command output control, which is a command format widely used at present. This paper describes the principle of operation, information process and operation procedure of this type of command control system. The performance for the process of command control is discussed. The probability analysis is also presented. The estimation of the system performance and the computation of engineering design can be realized using the methods and conclusion given in this paper.

AUTHOR: HE Lucheng

ORG: None

TITLE: "Repeated Trial of Guidance in Space Vehicles"

SOURCE: Beijing YUZHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS]
in Chinese No 2, 1981 pp 66-75

TEXT OF ENGLISH ABSTRACT: This article covers the advantages of the repeated method and the applications of the repeated method in strap-down inertial system. The differences between this method and those described in previous articles are:

1. Not only the reliability of the system, but also the accuracy of the system will be improved.
2. The key components which affect accuracy in guidance should be repeatedly fit in the optimum directions and those which affect reliability should be considered to be in the orthogonal or non-orthogonal repeated method.
3. This article provides the method of inspecting failure by means of range and derives the formulae for calculating accuracy and ineffectiveness. This method will make calculations simple and work of the system reliable.
4. Applying the theory mentioned above, the error in guidance will be decreased by $1/\sqrt{2}$ and the ineffectiveness can also be decreased by two orders of magnitude if a longitudinal accelerator and a two-freedom gyro are added to the strap-down guidance device.

AUTHOR: XU Wengan [1776 3306 1626]

ORG: None

TITLE: "Research of the Project for Adjusting the Thrust of a Solid Rocket Propulsor"

SOURCE: Beijing YUJANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS]
in Chinese No 2, 1981 pp 84-91

TEXT OF ENGLISH ABSTRACT: A concept of an adjustable solid propellant rocket motor was proposed. It is going to be achieved through the use of propellants having negative pressure exponent n . In this paper, the feasibility of the technique and characteristics of adjustment are discussed. Other advantages of the propellant with a negative pressure exponent are also presented.

9717

CSO: 4009/293

AUTHOR: YE Qinglong [5509 1987 0681]

ORG: Institute of Mineral Deposits, Chinese Academy of Geological Sciences

TITLE: "A Preliminary Study on the Mineral Assemblages and Mineralization of the Yinshan Lead-Zinc Deposit"

SOURCE: Beijing DIZHI LUNPING [GEOLOGICAL REVIEW] in Chinese Vol 27 No 3, 1981 pp 199-206

TEXT OF ENGLISH ABSTRACT: The Yinshan Pb-Zn deposit occurs as filling-replacement lodes in the phyllites of the Presinian Banxi Group east of the Xishan crater. In the deposit four main mineral assemblages can be recognized, representing four main stages of ore deposition respectively. The pyrite-quartz assemblage is the product of the earliest stage ore deposition, with a formation temperature ranging from 380 to 260°C. The pyrite-sphalerite assemblage has a formation temperature of 347-267°C and $\log f_{S_2} = -8.3 - -11.6$. The sphalerite ($X_{FeS}^{S_1} = 0.10$) in this assemblage displays a zonal structure: the opaque zone contains 12.7 wt percent Fe and the transparent zone 3.7 wt percent Fe, reflecting a variation in sulfur fugacity during ore deposition. The later deposition of the galena-sulfate assemblage is one of the characteristics of the deposit. The formation temperature of the sphalerite at this stage ranges from 285 to 240°C; $\log f_{S_2} = -9.5 - -12$. The galena-sphalerite-pyrogelinite assemblage is the product of the latest stage ore deposition. The sphalerite ($X_{FeS}^{S_1} = 0.02$) has a formation temperature of 228-155°C

[Continuation of DIZHI LUNPING Vol 27 No 3, 1981 pp 199-206]

and $\log f_{S_2} = -12.8 - -15.9$. Ore deposition occurred repeatedly. During each stage of ore deposition, the evolution of ore-forming fluids began with modification of country rocks and ended with deposition of the main mineral assemblage, and accordingly the ore-forming fluids changed from weakly alkaline through intermediate to weakly acid ones. The general trend in space and time of the ore deposition is the development from the pyrite stability field with higher temperature toward the galena-sphalerite stability field with lower temperature, thus producing lateral and vertical zoning of the mineralization.

AUTHOR: SUN Dapeng [1127 1129 7720]

ORG: Qinghai Institute of Salt Lakes, Chinese Academy of Sciences

TITLE: "The Regularities Governing the Distribution of High-iodine brines and the Direction for Iodine Prospecting in China"

SOURCE: Beijing DIZHI LUNPING [GEOLOGICAL REVIEW] in Chinese Vol 27 No 2, 1981 pp 231-236

TEXT OF ENGLISH ABSTRACT: In this paper, the regularities governing the distribution of high-iodine brines are discussed first.

1. High-iodine brines are mainly distributed in neritic and, less commonly, neritic-lagunal and partly lacustrine sediments of Paleozoic, Mesozoic and Cenozoic ages in sedimentary basins of some platform and fold regions. The iodine content in brines is generally by far higher than that in the sediments of the basins.

2. High-iodine brines only occur in the central parts of some hydrocarbon-bearing basins, in association with water-bearing beds in initial hydrocarbon pools and source rocks. The iodine content, however, is very low in their associated oil.

3. The distribution of high-iodine brines is mainly related to CaCl_2 -type brines in zones of hydrogeological stagnation. The brines may be divided into high-mineralized and low-mineralized high-iodine brines according to their iodine content and total dissolved solids content.

[Continuation of DIZHI LUNPING Vol 27 No 2, 1981 pp 231-236]

Finally, the direction for iodine prospecting in China is pointed out on the basis of the regularities of the distribution of high-iodine brines as stated above.

9717

CSO: 4009/316

AUTHOR: None

ORIG: Institute of Geophysics, Chinese Academy of Sciences

TITLE: "Explosion Seismic Study for Velocity Distribution and Structure of the Crust and Upper Mantle from Damxung to Yadong of the Xizang Plateau"

SOURCE: Beijing DIQIUWULI XUEBAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 24 No 2, Apr 81 pp 155-170

TEXT OF ENGLISH ABSTRACT: In order to study the layered structures and characteristics of the velocity distributions in the crust and upper mantle of the Xizang Plateau region, we have carried out explosions in the Yaraboyun, Pomu and Nam lakes. Nine seismic records were obtained along a profile 430 km long in a nearly north-south direction.

Six groups of phases of seismic waves through the crust and upper mantle in the area were observed which show different kinematic and dynamic properties. The results show that the crust and upper mantle of the Xizang Plateau are stratified. The thickness of its sedimentary layer is from 4 to 5 km. The crustal structures along the two sides of the Yarlung Zangbo River are different. The crustal thickness from north of the river to the Damxung region is from 70 to 73 km and the interfaces in the crust are essentially planes. Compared to that of the northern part, the crust of the southern part of the river is thinner. From the river to

[Continuation of DIQIUWULI XUEBAO Vol 24 No 2, Apr 81 pp 155-170]

the Yadong belt the crustal thickness is from 68 to 45 km. The crust of the Xizang Plateau also consists of high and low velocity layers. There is a low velocity layer in the lower crust and its thickness is 10 km with a velocity of 5.67 km/sec. A composite cross section and a model of the crust are given.

The northern boundary of the collision zone of the two plates is quite clear cut and every layer in the crust is upwarping toward the south. It shows that the formation of a thick crust and the uplift of the plateau are due to the results of a long period of compression, deformation and crustal shortening by folding in a large scale.

AUTHOR: HUANG Xude [7806 4872 1795]

ORG: None

TITLE: "Building-up and Development of Lithologic Seismic Prospecting"

SOURCE: Beijing DIQIUNULI XUEBAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 24 No 2, Apr 81 pp 218-228

TEXT OF ENGLISH ABSTRACT: Lithologic seismic prospecting contrasts sharply with structural seismic prospecting. In the past seismic prospecting was aimed at the underground structure. In recent years, i.e., since the 70's, the "bright-spot" and "pseudo velocity log," etc., methods have been developed for the study of lithologic characteristics of strata and the search for hydrocarbons. The methods already accepted by geophysicists are proved to be "indirect lithologic correlations" (comparing the well-known with sections). As for a "direct correlation," or the elastic wave parameters to be extracted from seismic sections, this is still under development.

Remarks on and evaluation of the essentials of indirect correlation and recommendations for direction correlation are presented in this paper.

9717

C50: 4009/311

Geophysics

AUTHOR: XU Zhongying [1776 0022 5391]

ORG: None

TITLE: "Diffraction Depth Migration"

SOURCE: Daodong SHIYOU DIQIUMULI KANTAN [OIL GEOPHYSICAL PROSPECTING] in Chinese No 2, 1981 pp 1-8

TEXT OF ENGLISH ABSTRACT: This paper presents a model for calculating travel time of diffracted waves from a velocity model and for making diffraction migration. The result of migrating is depth section. This method can be used in migration both after and before stacking. In areas where geologic structures are complicated, this method may prevent some inappropriate approximate hypotheses. The paper also illustrates the effects of this method by the calculation and analysis on a theoretical model.

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ORG: None

TITLE: "The True Amplitude Recovery of Sign-bit Seismic Recording"

SOURCE: Daodong SHIYOU DIQIUMULI KANTAN [OIL GEOPHYSICAL PROSPECTING] in Chinese No 2, 1981 pp 24-36

TEXT OF ENGLISH ABSTRACT: This paper discusses theoretically the problem of recovering true amplitude of sign-bit seismic recording. It gives respectively the error formulas in recovering true amplitude when probability density of random noise is in uniform distribution and in normal distribution. The examples are given of the recovery under both distributions. It is thought that the amplitude recovered from sign-bit seismic recording unceasingly approaches the true amplitude of primary seismic recording with the increase of stack traces. Experiments have shown that the stack traces needed should be no fewer than 700. Also, with the same stacked traces, better effects are achieved in the case of normal distribution of noise than in the uniform distribution case.

AUTHOR: LIN Ziqiang [2651 5261 1730]
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ORG: None

TITLE: "The Interpretation of Delta Seismic Facies"

SOURCE: Daoding SHIYOU DIQIUMULI KANTAN [OIL GEOPHYSICAL PROSPECTING] in Chinese
No 2, 1981 pp 61-65

TEXT OF ENGLISH ABSTRACT: On the seismic sections of the western depression of the Yinggehai Sea, several dipping reflected waves can be seen which often occur between T_1 - T_2 reflections. Based on an overall analysis of the formation parameters, section characteristics and drilling data in this region, it is believed that these dipping reflections mirror the characteristics of the delta seismic facies. An appraisal of oil and gas was made accordingly.

9717

CSD: 4009/324

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TITLE: "Aerosol Composition in a Nonurban Area Near the Great Wall"

SOURCE: Beijing DAQI KEXUE [SCIENTIA ATMOSPHERICA SINICA] in Chinese Vol 5 No 2, Jun 81 pp 136-144

TEXT OF ENGLISH ABSTRACT: In order to study the characteristics of aerosol composition in China, a cooperative research program on aerosol chemistry was carried out at an astronomical observing station near Xinglong. The samples were analyzed at the University of Lund, Sweden, and at Florida State University, U.S.A., by PIXE. The concentrations of the elements in the atmospheric aerosols are presented here. The results are compared with other measurements. It is found that during the cleanest period of sampling the concentrations of all elements, except S, are close to those of the background aerosols found in the Southern Hemisphere, while during the more polluted period concentrations of some elements, mainly due

[Continuation of DAQI KEXUE Vol 5 No 2, Jun 81 pp 136-144]

to coal combustion, are comparable to or even higher than those often found in North America, but the concentrations of those elements due to automobile exhaust are much lower and probably close to those of background aerosols.

* Visiting research scientist, March-April and July-August, 1980, on leave of absence from Florida State University.

AUTHOR: ZHOU Jiabin [0719 1367 2430]
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TITLE: "An Experiment of Numerical Prediction with a New Dynamic Initialization Scheme"

SOURCE: Beijing DAQI KEXUE [SCIENTIA ATMOSPHERICA SINICA] in Chinese Vol 5 No 2, Jun 81 pp 166-174

TEXT OF ENGLISH ABSTRACT: In this paper a new dynamic initialization scheme is proposed in which the distinct characteristics of the atmospheric adjustment process at different latitudes have been taken into account. At low latitudes the stress is put on the adjustment of pressure and temperature fields, while wind field is only given a moderate adjustment. At middle and high latitudes the adjustment of wind field is emphasized, while pressure and temperature fields are only slightly adjusted. The scheme quickly converges and the amount of computing time for initialization is equal to that required for a two to three hour forecast. Using these initialized fields a 48-hour forecast is made. Good results have been obtained.

AUTHOR: WANG Zhilie [3769 1807 3525]

ORG: Shanghai Typhoon Institute

TITLE: "The Influence of the Westerly Belt Long-wave Trough over Asia on the Western Pacific Typhoon Tracks"

SOURCE: Beijing DAQI KEXUE [SCIENTIA ATMOSPHERICA SINICA] in Chinese Vol 5 No 2, Jun 81 pp 198-206

TEXT OF ENGLISH ABSTRACT: The relationship between the main characteristics of the Pacific subtropical high and typhoon tracks during the occurrence of the westerly belt long-wave trough over some specific regions in Asia is discussed according to the interaction between the mid-latitude westerlies and the circulation system in the subtropical region. It is noted that when a large westerly trough is staying near 90°E , nearly all the western Pacific typhoons move westerly, which is dangerous for China. When there exists a long-wave trough near 120°E , most typhoons turn on the ocean. However, in this case any sudden development, decaying, alternation or retrogression of the trough is of great importance to the typhoon track forecast. When a deep cold trough develops near 150°E , completely different effects on the subtropical high and the typhoon tracks occur due to the different pressure systems over northeast China. Statistical data corresponding to the typhoon tracks under various synoptic situations are summarized and examples of historical cases which were difficult to forecast are given as well.

Modernization

AUTHOR: FENG Bin [6785 2430]

ORG: Research Institute of Electrical Engineering, Chinese Academy of Sciences

TITLE: "Man-made Thunder Probes the Earth's Strata"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 3 No 4, Apr 81 pp 4-5

ABSTRACT: Scientists have discovered that weak natural earthquake is very helpful for understanding stratigraphic structure. The seismic wave produced from the origin of an earthquake can be transmitted under the ground until it reaches the boundary of a different stratum, where a portion of the wave will be reflected back. When these reflection waves are received by a ground surface instrument and processed, the stratigraphic structure may be understood. This technique helps to find petroleum, natural gas, and other ore deposits. This is called seismic prospecting, and for many years explosives have been used to make an artificial earthquake origin to produce seismic wave for the purpose of prospecting. Since the 50's many techniques have been created to produce earthquake origins without explosives; electrical spark earthquake origin is one of these. This paper explains the structure of an electrical spark earthquake generator and its application under water and on land to probe the earth's strata. This technique is especially useful to probe such areas as farmland and vicinity of a city, a reservoir, etc. where the use of explosives is not advisable.

AUTHOR: WANG Xuesong [3769 1331 2646]

ORG: Dalian Research Institute of Physics and Chemistry, Chinese Academy of Sciences

TITLE: "Freshwater Flows Out of the Sea"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 3 No 4, Apr 81 pp 18-19

ABSTRACT: This paper explains the technique of reverse osmosis and its application since its appearance in 1953 for the desalination of sea water and the treatment of all sorts of wastewater. Research on reverse osmosis in China began in 1966. Since then, acetate cellulose and non-acetate cellulose reverse osmosis membranes have been made and they have been assembled into plate type, pipe type, bundle type, and hollow fiber type reverse osmosis instruments. Some of these are being extended at present. The future of this technology is believed to be very promising. Drawings are included to explain the theories of osmosis and reverse osmosis and to depict the structures of 4 types of reverse osmosis instruments.

AUTHOR: DAO Yunqiao [7637 0061 2881]

ORG: None

TITLE: "An Answer to the Energy Challenge"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 3 No 4, Apr 81 pp 10-11

ABSTRACT: It is likely that fossil fuels, which are nature's gift to mankind will be gradually exhausted in the next hundred years. What are our future generations to do when there will be no coal, petroleum, and natural gas to supply the energy? Clever scientists of today are trying very hard to provide an answer to this serious challenge of energy shortage, and nuclear energy shines like a pearl in the energy treasure-house. In separate sections, this paper explains the status of nuclear energy today and the projected condition of nuclear energy tomorrow. Finally, in a section titled "Nuclear Energy Day After Tomorrow," the strange nuclear fireball [plasma gas], the laser nuclear fusion reactor, and the fusion-fission mixed reactor are briefly introduced.

AUTHOR: CUI Jintai [1508 6855 3141]

ORG: None

TITLE: "Competition Between Smoothbore and Linebore Guns"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 3 No 4, Apr 81 pp 36-37, 3

ABSTRACT: The reason that tanks have become moving fortresses of modern ground warfare is mainly its powerful cannon. Since their appearance more than 60 years ago, linebore has been inseparable from tank cannons. The lines inside the chamber cause the projected bullet to revolve in a very high speed to guarantee its stable flight in the air. The linebore design had had a monopoly until the early 50's when it met the competition from the smoothbore design. The bullet fired from the smoothbore does not revolve, but it is faster and more powerful and has a more precise aim. Moreover, the firing tube of cannon with the smoothbore has a longer useful life as well. This paper discusses the merits and demerits of both designs. As the linebore is more suited for different kinds of bullets, it will obviously have a dominance in the future, but, on the other hand the USSR and W. Germany are developing the smoothbore in a big way. Each country must decide for itself in the choice between the two, according to its own concrete conditions.

AUTHOR: LIN Yuanying [2651 0337 5391]

ORG: Shanghai Municipal First People's Hospital

TITLE: "Contraception by Immunity"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 3 No 5, May 81 p 3

ABSTRACT: Components of semen and ovum all have specific antigen. When one or the other is used to make a vaccine for man or for woman, fertilisation may be prevented. The use of most of these antigens is still in the experimental stage. The author and colleagues extracted and prepared an antiserum from swine ovary to treat and immunize female rabbit against pregnancy. A satisfactory result has been preliminarily obtained. The author and colleagues are also participants in a joint research on the use of HCG as a contraceptive or an abortive agent. Some units have made preliminary progress and begun to carry out clinical tests. Sterility may be caused by an interaction of antigen and antibody of a married couple. This knowledge has been frequently reported in foreign countries. The author and colleagues are also carrying out research to clarify the antigen problem in conception in the hope of making a vaccine for either man or woman to produce artificial immunity against pregnancy.

AUTHOR: MA Dancou [7456 1129 6180]

ORG: Petroleum Association

TITLE: "A New Look at Extracting Oil From Shale"

SOURCE: Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 3 No 5, May 81 pp 8-9

ABSTRACT: At present, there are mainly 2 ways of utilizing oil shale: (1) Through dry distillation, shale oil or gaseous fuel may be produced; (2) As a boiler fuel to burn oil shale directly. The oil shale of Fushun and Nourmang of China is currently being utilized with the dry distillation method. The oil shale must first be broken down to pieces of a suitable size before dry distillation in a complicated procedure. An underground distillation technique has been introduced in the USA in recent years to make oil shale utilization more attractive, but it is still in an experimental stage. In the USSR, a giant thermal power plant has been completed using oil shale directly as the fuel. After burning, the ash of the oil shale makes a good raw material for cement. China is one of the countries of rich oil shale resources. According to a survey of 1962, the reserve is about 2×10^{11} tons. With the advancing technology, oil shale utilization will certainly not be so discouraging, within the next 10 to 20 years.

6168

CSO: 4009/318

AUTHOR: HUANG Ditan [7806 4574 5672]
WANG Zemin [3769 0463 3046]
SHI Guoshi [4258 0948 0013]

ORG: None

TITLE: "Paleogeomorphologic Features of Shan-Gan-Ning District During the Indo-Chinese Stage and Its Significance in Petroleum Geology"

SOURCE: Beijing SHIYOU XUEBAO [ACTA PETROLEI SINICA] in Chinese Vol 2 No 2, 1981 pp 1-10

TEXT OF ENGLISH ABSTRACT: In dealing briefly with the geological development of the Shan-Gan-Ning district, the paper lays particular emphasis on the geological aspects of the erosional landform at the close of the Indo-Chinese stage when the topographic relief was greater than 300 meters and a big branching river system was developed. Such a landform left a notable impact on the sedimentary overburden of Early Jurassic. It restricted the distribution of the sandstone facies zone and the river system at the bottom of Jurassic and resulted in the occurrence of many compaction structures or buried-hill structural groups. It is this kind of buried-hill structure, coupled with favorable lithologic conditions, that determines the oil and gas field distribution in the Jurassic of this area and may serve as the direction in the search for oil. From the point of view of paleogeomorphology, the buried-hill compaction structures in the hilly land along the

[Continuation of SHIYOU XUEBAO Vol 2 No 2, 1981 pp 1-10]

river banks in front of the mountainous region are the loci for the accumulation of oil and gas.

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XUE Yaosong [5641 5069 2646]
YU Congliu [0205 1783 3177]

ORG: All of the Nanjing Institute of Geology and Paleontology, Chinese Academy of Sciences

TITLE: "Distribution and Depositional Environments of the Sinian Carbonate Rocks in South China"

SOURCE: Beijing SHIYOU XUEBAO [ACTA PETROLEI SINICA] in Chinese Vol 2 No 2, 1981 pp 11-19

TEXT OF ENGLISH ABSTRACT: The purpose of this paper is to study the environmental conditions and to illustrate the belts of the basic facies of the Upper Sinian carbonate rocks which are widely distributed in south China. The Dengying Formation of Upper Sinian consists mainly of dolomites containing a large number of algae of different structures. They developed in the platform representing marine shallow water conditions. They were formed by the interaction between blue-green algae and a variety of mechanical and diagenetic processes. By means of petrographical analysis, carbonate rocks accumulated during Late Sinian in this area are divided into three basic facies belts: 1) shallow marine platform, 2) slope and 3) open basin. In addition, based on paleontologic and petrographic data, the shallow marine platform may be subdivided into several types: the lagoons on the

[Continuation of SHIYOU XUEBAO Vol 2 No 2, 1981 pp 11-19]

platform, the algal banks, the algal banks with patch reefs and the foreslope of the platform. These facies will play an important part in tracing mineral resources and recognizing the relationship between environment and life in the geological past. The data on the distribution and thickness of carbonate rocks show that there is uniformity in the accumulation of carbonate rocks and the development of algal populations.

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TITLE: "Petroleum Geological Characteristics of the Biyang Depression, Henan"

SOURCE: Beijing SHIYOU XUEBAO [ACTA PETROLEI SINICA] in Chinese Vol 2 No 2, 1981
pp 21-28

TEXT OF ENGLISH ABSTRACT: The Biyang depression is located in the southwestern part of Henan Province. It is one of the sub-depressions in the Nanyang basin, with a total area of 1000 sq km. Two oil fields have been discovered so far. The depression is petroliferous in spite of its small size, and it has distinct features in petroleum geology.

The Biyang depression is an inland freshwater, faulted basin. The conditions for oil generation were excellent due to the deeply faulted subsidence of the basin and the high speed of sedimentation. The sediments in the basin come from many sources, with seven sandstone bodies of different types extending deep into the source rock area, forming reservoirs at favorable locations. At present, oil fields have been discovered in the front parts of two sandstone bodies.

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Anticlines are not developed in the basin, as the main traps for hydrocarbons are lithological, generally of the updip shale-out type, which account for 86.3 percent of the total proven reserves. This type of hydrocarbon trap has not been explored adequately in China, so it gives us a useful clue to finding more non-anticlinal fields.

The property of the crude oil is unique with high paraffin content (33~45 percent), high pour point (39~44°C), and especially the high content of ozokerite (5~11 percent) with dropping point to 80°C, which is rarely seen in China or abroad. The reason for its occurrence is yet to be investigated.

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Shipbuilding

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TITLE: "Component Modal Synthesis of the Coupled Vibration of Ship Hull"

SOURCE: Wuxi ZHONGGUO ZAOCHUAN [SHIPBUILDING OF CHINA] in Chinese No 2, Apr 81
pp 61-71

TEXT OF ENGLISH ABSTRACT: This paper introduces an analytical method in component modal synthesis applicable to the study of coupled vibrations of the hull. Using this method, we calculated the vibration of a 16,000-ton collier and analyzed the coupled vibration among the individual substructures performed in ship vibration. From this the paper provides theoretical bases for the calculation for coupled vibration between local vibration, such as the afterbody, the double bottom in the engine room, the superstructure, etc., and the higher mode vibration of the main hull girder. The calculated and experimental results agree well with each other, that is, within 1.2 percent.

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TITLE: "A Mathematical Model and Its Numerical Treatment of the Fuel Injection System in Diesel Engines"

SOURCE: Wuxi ZHONGGUO ZAOCHUAN [SHIPBUILDING OF CHINA] in Chinese No 2, Apr 81
pp 72-82

TEXT OF ENGLISH ABSTRACT: A mathematical model and its numerical treatment concerning the fuel injection process of the most conventional Bosch type injection equipment in diesel engines are discussed. A number of factors are considered, including the pressure wave and viscous resistance in high pressure oil pipes and the changes of flow areas in high pressure oil channels. Efforts have been made to deal with cavitation in the system. The results of several typical computational examples for the investigation show that the calculated values are in good agreement with the measured values. The numerical methods mentioned in the paper are for reference for injection pump designers.

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